

REMARKS

Claims 1-10, 12-14 and 16-32 are pending in the application.

Claims 13, 31 and 32 are withdrawn from consideration.

Claims 18-21 are allowed.

Claims 1-3, 6-9, 12, 14, 16 and 22-30 are rejected.

Claims 4, 5, 10 and 17 are objected to.

Claim 14 is rejected under 35 U.S.C. § 112.

Claims 1-3, 6-9, 12, 14 and 16 are rejected under 35 U.S.C. § 102(e).

Claims 22-30 are rejected under 35 U.S.C. § 103(a).

Claims 14, 16, 22, 24 and 27 are amended.

No new matter is added.

Claims 1-10, 12, 14 and 16-30 remain in the case for consideration.

Applicant requests reconsideration and allowance of the claims in light of the above amendments and following remarks.

Election Restriction

The Applicants acknowledge the constructive election made by the Examiner withdrawing claim 13 in the prior Office Action. However, the Applicants contend that a generic claim is present that mandates that claim 13 be rejoined with the application upon allowance of the generic claim. In particular, claim 13 depends on independent claim 12 and merely provides additional limitations about the elastic member element claimed in claim 12. Hence, claim 12 is generic over claim 13. The Applicants submit that while claim 13 may be presently withdrawn, that it should be rejoined with the application upon allowance of claim 12.

In the Claims

Claim Objections

Claim 16 is objected to for grammar informalities. The Applicants have amended line ¹₀ of claim 16 as suggested by the Examiner, but have left line 4 since it recites “uneven surfaces,” which is grammatical correct without the modifier “an.”

Claim Rejections – 35 U.S.C. § 112

Upon reconsideration, claim 14 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In particular, claim 14 is rejected because its recitation of “a connection member, which hinge” has insufficient antecedent basis and/or missing words. Claim 27 also has insufficient antecedent basis for the term “biasing member.” Claim 14 has been amended to clarify this wording and claim 27 has been amended to correct the antecedent basis problem as suggested by the Examiner.

Claim Rejections – 35 U.S.C. §102

Claims 1-3, 6-9, 12, 14 and 16 are rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Pat No. 6,657,859 to Karr (“Karr”).

Claim 1 is directed to an apparatus that includes:

- two heat exchange members configured to be placed on both sides of a semiconductor module, the semiconductor module including a plurality of packages;
- a connection member between the two heat exchange members configured to movably join the two heat exchange members, wherein portions of the two heat exchange members are configured to protrude above the semiconductor module; and
- a biasing member disposed between the two heat exchange members and configured to provide a force that holds the two heat exchange members against the packages of the semiconductor module.

In particular, the apparatus of claim 1 includes the elements of two heat exchange members configured to be placed on both sides of a semiconductor module, the semiconductor module including a plurality of packages, and a biasing member disposed between the two heat exchange members and configured to provide a force that holds the two heat exchange members against the packages of the semiconductor module.

In contrast, Karr merely teaches a heat exchanger that contacts a single side of an electronic package. Figures 2A and 2B of Karr clearly show that the heat exchanger 125 (and heat exchanger block 215) only contacts a single side of electronic package 120, which is mounted on a motherboard 205. See col. 3, lines 5-59. In the Office Action, it is asserted that the two heat exchanger members are taught by elements 400A and 400B as shown in figures 4A and 4B. While the Applicants agree that elements 400A and 400B are part of the heat exchanger unit taught in Karr, the Applicants point out that these elements are placed on both sides of

another heat exchanger part (element 125) and are not configured to be placed on both sides of a semiconductor module that includes a plurality of packages. This point is clearly visible in figures 4A and 4B and is described in detail in col. 4 line 47 – col. 5, line 12 (see especially col. 4, lines 47-50). Hence, Karr does not teach at least this element of claim 1.

Thus, because Karr does not teach all of the elements of claim 1, Karr cannot anticipate claim 1. As such, the Applicants submit that claim 1 is in proper form for allowance, and request that the rejection under § 102(e) be removed.

Claims 2-3 and 6-9 depend from claim 1. Based at least in part on this dependency, the Applicants submit that claims 2-3 and 6-9 are likewise in proper form for allowance.

Claims 12 and 16 include similar limitations to claim 1. In particular, both claims 12 and 16 specify first and second heat exchanger members that contact different surfaces of a semiconductor module. As was discussed above with respect to claim 1, Karr does not teach heat exchanger members that contact multiple surfaces of a semiconductor module. Thus, because Karr does not teach all of the elements of claims 12 and 16, Karr cannot anticipate claims 12 and 16. As such, the Applicants submit that claims 12 and 16 are in proper form for allowance and request that the rejection under § 102(e) be removed.

Claim 14 depends from claim 12. Based at least in part on its dependency, the Applicants submit that claim 14 is likewise in proper form for allowance.

Claim Rejections – 35 U.S.C. §103

Claims 22-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat No. 5,910,883 to Cipolla et al. (“Cipolla”).

Claim 22 has been amended to specify that the clamp structured to force a portion of the thermally conductive substrate against a top surface of one or more heat generating components that are attached to a circuit board.

In contrast, Cipolla does not teach the claimed clamp. In particular, the clamp or hinge (element 22 – see figure 1 of Cipolla) taught in Cipolla does not force a portion of the heat spreader (32 – interpreted as the thermally conductive substrate) against the heat generating component (28). Rather, as is clearly indicated in figure 1 of Cipolla, the spring 22, if anything, biases the spreader 32 away from the heat generating component 28. Figure 2b of Cipolla further shows that even in a closed state, the spring 22 is not taught to force the spreader 32

against the heat generating component 28. Hence, Cipolla does not teach or otherwise suggest all of the elements of claim 22.

Thus, because Cipolla does not teach or suggest all of the elements of claim 22, Cipolla cannot render claim 22 unpatentable. As such, the Applicants submit that claim 22 is in proper form for allowance, and request that the rejection under § 103(a) be removed.

Claims 23-30 depend on claim 22. Based at least in part on their dependency, the Applicants submit that claims 23-30 are likewise in proper form for allowance.

Allowable Subject Matter

Claims 4, 5, 10 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 18-21 are allowed.

The Applicants thank the Examiner for acknowledging the patentable subject matter of these claims. However, because the Applicants contend that the underlying base claims of claims 4, 5, 10 and 17 are in proper form for allowance, as discussed above, the Applicants submit that these claims are properly allowable in their current form.

Conclusion

For the foregoing reasons, reconsideration and allowance of claims 1-10, 12, 14 and 16-30 of the application as amended is requested. The Examiner is encouraged to telephone the undersigned at (503) 222-3613 if it appears that an interview would be helpful in advancing the case.

Respectfully submitted,

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